

Annual Vehicle Taxation Policies in Europe: Who Gains and Who Loses from Change?

STEVE COUSINS AND STEPHEN POTTER

Annual vehicle taxes can be replaced by taxes on fuel. This may be desirable for energy or transport policy purposes. The effects of this abolition option are examined (a) between interest groups in a single nation and (b) between member nations of the European Economic Community (EEC). In the United Kingdom, rural motorists claimed they would be disadvantaged by such a change. Use of the United Kingdom National Travel Survey showed that they would benefit or show no change in total tax paid. In the United Kingdom, 60 percent of new car purchases are made by companies. The cars purchased by companies are larger than privately purchased new cars and exhibit high annual mileages. Abolition of annual vehicle taxes would increase the taxation of company cars. In the EEC countries, abolition of annual taxes would result in more fuel tax paid by larger vehicles in the United Kingdom and Ireland; about the same level of tax in Denmark, Holland, and Germany; and less tax in France, Belgium, and Italy. The different annual automobile taxes provide some nontariff protection of national car manufacturing industries. A mix of higher fuel taxes, higher initial purchase taxes, and improved consumer information is recommended if annual automobile taxes are abolished in the EEC for reasons of energy and transport policy.

In the aftermath of the 1973-1974 oil crisis, several European studies (1-4) have examined the role of vehicle taxation in promoting energy-efficient transportation. Traditionally, vehicle taxation has been used primarily as an instrument of fiscal, industrial, and economic policy rather than transport policy. Vehicle taxes are general taxes that are levied from the transport sector. Of necessity, any use of vehicle taxation for transport policy purposes must influence these other policy areas.

There are three main types of vehicle taxes levied by European Economic Community (EEC) governments--purchase tax, a single tax on the initial purchase of an automobile; annual vehicle license tax, an ownership tax that, although it may vary with vehicle weight or engine size, remains constant however much that vehicle is used; and fuel tax, which of course is very much related to the vehicle's use and its fuel efficiency.

In recent years, an increasing concern with energy conservation and a shift in transport policy toward recognizing the social effects of high automobile use have led a number of European countries to question the validity of the annual vehicle license system.

For example, in Britain all owners of private automobiles pay the same license fee. This does little to encourage the development of fuel-efficient vehicles and does not reflect the use that a vehicle makes of the road system.

One possible change is the abolition of the annual vehicle license and its replacement by a variable tax, such as a tax on fuel. This option has been extensively debated in Britain (5), in the Netherlands (4), and for the EEC as a whole (1). In this paper we examine the transport goals to which changed taxation could contribute. We then examine the likely effects that such a use of transport taxes would have on different groups within a country and how different national interests are affected within the EEC.

BRITISH CASE STUDY

The British annual vehicle license system, vehicle excise duty (VED), is the only system in Europe in

which all automobiles pay a fixed tax. Originally Britain had a graduated fiscal horsepower license, but this was replaced by the fixed-rate system in 1948. The major reason for this was to encourage the sale of large-engine automobiles, thus providing British manufacturers with a domestic market base on which exports to the United States and Australia could be built (6).

By the late 1970s the basis of this particular industrial policy had changed, and in 1978 it was proposed that the automobile license be abolished and the lost revenue be made up by an additional fuel tax. Five major reasons were cited by the Department of Transport (7):

1. Reduction in tax evasion, estimated to cost £50 000 to £63 000 annually;
2. Fairer basis (with the tax shifted to fuel, larger automobiles would pay more than small automobiles; also, it was known that higher-income households drive more and own larger vehicles, so this would produce a progressive tax system);
3. Administrative savings;
4. Energy conservation (the marginal nature of fuel tax would aid energy conservation and encourage the use and production of fuel-efficient vehicles); and
5. Change in transport policy--the shift to a totally marginal tax system would make people more aware of the real automobile costs relative to alternative transport modes.

The net effect of this proposal would have resulted in the amount of tax paid being directly proportional to fuel used. This is a function of vehicle consumption rates and distance driven, as Table 1 shows.

PUBLIC REACTION

This proposal met with considerable resistance from the British Press and Parliament. Both were concerned with the distributional effects of such a change. It was seen as a move that would shift the burden of taxation from urban areas, where automobile mileages were perceived to be low, to the rural community, where automobile mileages were perceived to be high. The effects on low-income groups in rural areas were emphasized.

DISTRIBUTION OF COSTS AND BENEFITS

In order to test the validity of such claims, we conducted a study into the distributional effects of the existing and proposed automobile tax systems by using the very detailed information available from Britain's 1975-1976 National Travel Survey. To our surprise, this government survey had not been used in preparing the tax-change proposals.

There is a clear relationship between income and vehicle mileage, as Table 2 shows (1¢ = \$2.02 (1976 U.S. dollars)). Under average motoring conditions, the "break-even" mileage between the two tax systems was estimated by the Department of Transport to be 7500 miles (12 077 km) in urban areas but 10 000 miles (16 108 km) in the countryside. The latter

Table 1. Index of fuel tax replacement of annual vehicle license for range of European automobiles.

Automobile Type	Engine Size (cc)	Index of Tax Paid Based on Fuel Consumption ^a	Index of Avg Annual Mileages ^b	Overall Index of Tax	Existing Annual Vehicle License Index
Citroen Dyane 6	600	100	100	100	100
Fiat 127	900	118	100	118	100
BL Mini 1000	1000	118	110	119	100
Renault 14 TL	1200	129	126	132	100
VW Passant	1300	164	144	236	100
Fiat 131	1600	180	144	259	100
BMW 320	2000	221	161	356	100
Mercedes 280	2800	267	161	430	100

^aEEC Commission Interim Report (1).

^bNational Travel Survey, 1975-1976 (mileage and engine-size data from unpublished tables).

Table 2. Distribution of annual vehicle mileage in Britain by income of household.

Annual Mileage (miles)	Annual Household Income (£)								
	0 < 1250	1250 < 2000	2000 < 3000	3000 < 4000	4000 < 6000	6000 < 7500	7500 < 10 000	10 000 +	All
	N=241	N=520	N=1252	N=1424	N=2765	N=964	N=645	N=362	N=8173
Under 3000	38	19	15	14	11	8	8	5	13
3000 < 5000	18	25	15	14	11	11	10	12	13
5000 < 7000	20	22	21	19	18	18	15	19	19
7000 < 9000	7	10	12	12	14	14	12	11	13
9000 < 10 000	3	2	3	3	3	3	5	3	3
10 000 < 12 000	5	9	13	14	15	16	18	14	14
12 000 < 18 000	8	9	13	16	18	21	20	22	17
18 000 < 25 000	1	1	5	5	5	5	7	7	5
25 000 < 35 000	1	2	2	3	4	3	3	6	3
35 000 < 50 000	-	-	-	1	1	2	1	-	-
50 000 +	-	-	1	1	-	-	-	-	1

Notes: In this table alone, all vehicles, including motorcycles, are included, since the tax-change proposal would affect all VED-paying vehicles; in subsequent tables, only automobiles are included, since their use is the main focus of this study. 1 mile = 1.6 km.

1 £ = \$2.02.

Data are from National Travel Survey, 1975-1976.

reflects better fuel consumption on uncongested rural roads. Those who travel in excess of this figure would pay more if VED were replaced by fuel tax, and those driving less would gain. This indicates that the change to an all-fuel tax system would shift the burden of taxation onto higher-income groups and so make automobile taxes more progressive.

The fact that lower-income households would pay less overall tax does not deal with the rural/urban argument, in particular the argument that there are low-income rural motorists forced to drive higher mileages. But in actual fact, according to the National Travel Survey, the differences between average urban and rural automobile mileages are remarkably small, as shown below ("rural" is defined as households in settlements with populations of less than 3000; 1 mile = 1.6 km):

Area	Mileage (miles)	
	Urban	Rural
England	8 900	9 500
Wales	9 700	10 600
Scotland	10 400	10 100
Great Britain	9 400	10 000

Given a similar pattern of vehicle performance and fuel consumption, this 9 percent higher mileage would represent a shift in taxation to rural areas of a comparable magnitude. But fuel-consumption rates are not the same. In rural areas, Department of Transport road tests have estimated fuel consumption to be up to 25 percent better than in urban areas, due to lack of congestion. Hence, rather than representing a shift in taxation from urban to rural areas, the reverse is more likely.

TRANSPORT AND ENERGY POLICY

The transport and energy policy inputs in the proposal to abolish the automobile license reflected an increasing concern for trends in transport energy use and for the social effects that high car use was causing via the associated decline in public transport provision.

An important influence on such a transport and energy policy is the use of company automobiles. These are vehicles that are purchased by the company for an employee and are then available for the employee's normal household travel. It should be noted that usually these vehicles are not given to the employee because of high mileage driven in the course of work but as an addition to a salary. Although the use of company automobiles is greatest in the United Kingdom, it is also growing in other EEC countries.

Over the last eight years, companies have rapidly increased their share of the new-automobile market and now account for more than 60 percent of all vehicles sold in the United Kingdom. They have a major influence on the vehicle stock. As shown below, the type of vehicle purchased by companies and that purchased by private individuals are very different according to a Department of Transport unpublished 1979 analysis of registration documents:

Engine Size (cc)	Percent of Total	
	Company	Private
Up to 1200	11.3	29.5
1200-1500	28.5	33.9
1500-1800	28.6	18.1
1800-2200	17.6	10.8
2200-3000	11.1	4.3
3000+	2.9	1.4

Average engine size of company cars is 1650 cc and that of private cars is 1390 cc.

Sixty percent of company car purchases have engines larger than 1.5 L, whereas only 37 percent of private car purchases are larger than this size. Company vehicles also cover higher annual mileages and, taken together, this means that although the shift in taxation between rural and urban areas would be minimal, the abolition of annual automobile tax would have resulted in a large shift in taxation from private individuals to the commercial sector.

This proved to be an important factor in deciding the fate of the automobile tax reform proposal, for in May 1979 the Conservative Party, under Prime Minister Margaret Thatcher, came into power with a policy to improve business incentives and lower taxation. In November 1979, the Minister of Transport announced that the existing automobile license system was to be retained (8):

We have carefully considered the arguments for and against abolishing excise duty on petrol-driven vehicles and replacing it by increased petrol taxation. But we have concluded that the case is not sufficiently strong to justify this major change. We were particularly concerned that abolition would place too big a share of the burden of motoring taxation on high mileage rural motorists and essential business users.

The cited reasons show the influences behind this decision. The widespread belief among rural motorists that they would be disadvantaged by this tax change had little basis in reality. But a perception or a belief, however inaccurate it may be, can still be an important political influence.

The above quotation also indicated the way in which transport and energy policy became subservient to fiscal policy. In terms of equity, income distribution, and transport or energy policy, there are no reasons why companies should not pay more taxes. They use the roads more and impose on other motorists a costly, high-fuel-consuming type of automobile. Yet the general desire to reduce company taxes led to the retention of the fixed annual tax. For much the same reason, the alternative of returning to the graduated automobile license system appears not to have been considered.

In Britain it appears that transport taxation is still a branch of general fiscal policy. A coherent policy on transport taxes, reflecting transport and energy goals, has yet to develop.

COMPARISON BETWEEN EEC NATIONS

All EEC nations, with the exception of the United

Kingdom and Ireland, have an annual vehicle license system that is related to vehicle size. In Germany and Luxembourg, engine cylinder capacity determines the tax; in Belgium, France, and Italy there is a fiscal horsepower rating system. Ireland had a progressive fiscal horsepower tax until 1977 when annual tax was abolished for all but the largest category, 16-hp, and an annual registration fee was introduced. Only 1.5 percent of vehicles are of 16 hp or more and the annual registration fee has since been increased substantially. Thus for 98.5 percent of its cars, Ireland may be grouped with the United Kingdom as having a fixed tax system. Incidentally, no additional fuel tax accompanied the Irish abolition of the vehicle license in 1977. This was a tax-reduction measure designed to benefit higher-income groups.

Table 3 shows the range of tax paid according to the various vehicle license systems in Europe. There is a great variety in the rate of progression, from a ratio over this range of 1:1 in Britain to nearly 20:1 in Italy. For the British pattern of vehicle use, a fuel-tax replacement would produce a level of progression roughly halfway along this European league.

The abolition of the annual vehicle tax and its replacement by a fuel tax would have radically different effects in member countries. From Table 3, three groups of nations can be distinguished in which there would be similar socioeconomic and energy conservation effects:

Group 1: In the United Kingdom and Ireland, the tax change would be progressive; higher-income higher-fuel consumers would pay more, as was discussed in the previous section for the United Kingdom.

Group 2: In a second group, made up of Denmark, the Netherlands, and Germany, there would be little change in the distribution of taxation if annual licenses were abolished. This assumption does depend, however, on the positive relationship between the engine size of a vehicle and its annual mileage (see Table 1). Since little change is likely in the total taxation of vehicles of different sizes, unlike the case in the United Kingdom, the decision to adopt the change must be based purely on the merits of taxation of use versus taxation of ownership and the effects of this on energy and transport policy. The intrinsic importance of such a change in the method of taxation is discussed later.

Group 3: The third group of nations--France, Belgium, and Italy--would receive a considerable stimulus to the purchase of larger, less fuel-efficient vehicles if annual taxes were replaced by a fuel tax. This change would also favor high-income groups rather than low-income groups.

Table 3. EEC automobile annual license taxation systems.

Automobile Type	Fuel Consumption (L/100 km)	Unladen Weight (kg)	Engine Capacity (cc) ^a	Index of Vehicle License Tax Paid ^b									
				United Kingdom	Ireland (1978+)	Denmark	Netherlands	Germany	Ireland (to 1977)	France	Belgium	Italy	Proposed UK Fuel-Tax Index
Citroen Dyane 6	6.1	600	600	100	100	100	100	100	100	100	100	100	100
Fiat 127	7.2	705	900	100	100	120	120	150	190	160	120	190	118
BL Mini 1000	7.2	615	1000	100	100	120	120	170	210	160	180	190	119
Renault 14 TL	8.0	865	1200	100	100	170	170	200	255	160	230	340	132
VW Passant	10.0	885	1300	100	100	170	170	210	255	160	230	390	236
Fiat 131	11.0	965	1600	100	100	170	200	260	380	400	340	570	259
BMW 320	13.5	1115	2000	100	100	170	240	330	460	400	520	800	356
Mercedes 280	16.3	1455	2800	100	780	290	340	460	690	690	990	1960	430

Note: Data are from EEC Commission Interim Report (1); information on Ireland from D.P. Feeney (2); 1 L = 0.264 gal; 1 km = 0.6 mile; 1 kg = 2.2 lb.
^aPercentage of new registration under 1000 cc: UK, 11; Germany, 10; Ireland (to 1977), 18; France, 26; Italy, 53.
^bDyane 6 = 100.

Another way in which EEC countries have different interests is in the distribution of automobile manufacturers (9). The number of automobiles manufactured and assembled in the EEC in 1977 is distributed among the EEC countries as follows:

Country	Automobiles (000s)	
	Manufactured	Assembled
Germany	3.796	0
France	3.559	0
Italy	1.440	0
United Kingdom	1.316	0
Belgium	0	1.013
Netherlands	53	15
Ireland	0	50
Denmark	0	0
Luxembourg	0	0

The risk that energy conservation measures will depress the European automobile industry, though valid, is a concern that is very differently shared between the producer and nonproducer nations. In the United Kingdom, the 30 percent rise in real fuel cost over the period 1973-1975 was associated with a 25 percent fall in new-vehicle purchases. Automobiles in their first two years of life have high annual mileage--15 000 miles (24 000 km)--compared with 7000 miles (11 200 km) average for the rest of the vehicle's life (10). Therefore, transferring the annual tax to petrol will result in a real increase in motoring costs for those operating new vehicles, which would thus lead to fewer new automobile sales according to Mogridge's model (1977) (11).

There are also significant differences among the interests of the producer countries themselves. Simply removing the annual tax would cause grave problems for the French and Italian car industries, which specialize in the production of small vehicles. The highly progressive annual vehicle taxes in these two countries favor their own national car industries and so create some protection for domestic markets.

The German industry would appear to be little affected by such a change, since it has already succeeded in selling domestically produced large vehicles in spite of the existing progressive annual tax system. Factors such as a well-developed freeway system and the high per capita gross national product are probably relevant to the choice of large vehicles in Germany.

One avenue not yet explored in the studies of European vehicle taxation is to replace the highly progressive annual taxes in France and Italy by a fuel or use tax coupled with a progressive purchase tax. This would maintain the incentive to buy small (domestically produced) vehicles and maintain the current distribution of wealth and also allow some increased taxation of vehicle use rather than ownership. Member nations could substantially increase purchase taxes before reaching Denmark's current level, but automobile producers are likely to be opposed to such a policy. Purchase taxes as a percentage of pretax retail price are as follows (12) (those for the Netherlands and Denmark depend on price):

Country	Tax (% of retail price)
Luxembourg	10
Germany	13
United Kingdom	24.6
Belgium	25
France	33.3
Ireland	18
Italy	18
Netherlands	40-50
Denmark	150-234

Thus for the United Kingdom and Ireland, the abolition of annual fixed vehicle taxes would be a progressive economic and energy-conservation measure. The abolition of progressive annual vehicle taxes in Germany, the Netherlands, and Denmark remains valid only if the policy of replacing annual by use-related taxes really does achieve energy savings. For those countries with high progressive annual taxes, a partial removal is possible if coupled with an increased fuel tax. Total removal of the annual tax could be justified if it were coupled with both an increased fuel tax and an increased purchase tax to ensure the continuation of their highly progressive taxation system.

USER PERCEPTION OF AUTOMOBILE COSTS

Automobile running costs are not accurately perceived by the vehicle user (13). This contrasts with other use charges relevant to automobile users, such as car-park charges, road tolls, and public transport fares. These direct payments are clearly perceived. Metcalf (13) concluded that although of all running costs fuel is the only commonly perceived expenditure, money was twice as easily spent on fuel as on the direct expenditures.

So, for example, someone might use 20 pence worth of fuel to avoid a 10-pence parking charge. The mechanism that Metcalf proposed to account for this was that the driver does not normally perceive the cost of travel and so does not rationally compare the parking and driving options. (The driver is thus short of important information.) Dix and Goodwin (4) have shown that private motorists are precisely aware of the annual tax rate for their vehicle but have an inaccurate perception of the automobile's running costs per mile. Given this, shifting taxation from an accurately perceived cost (annual vehicle tax) to a poorly perceived cost (running costs and fuel) may nullify the energy and transport policy gains anticipated. Indeed, Dix and Goodwin consider that changes in the type of vehicles purchased might offset fuel savings, given the low short-term price elasticity in the United Kingdom (-0.1 to 0.15), although they consider the long-term elasticities to be higher (approaching -1.0).

Because of the problems of user perception of vehicle running costs and the comparative clarity of annual taxes, one approach is to try to overcome the lack of information that motorists have about running costs. Metcalf proposes the use of electronic travel cost meters on automobile dashboards, an innovation that is already available in some new vehicles. A similar approach, that of providing improved consumer information, can be made at the point of sale of new vehicles. EEC countries require new automobiles to display mile-per-gallon data based on a standard urban driving cycle and for cruising at 56 and 70 mph (90 and 110 km/h). This requirement could be extended to express total annual fuel costs (including the fuel-tax element) derived from national average mileages. This would aid the perception of annual costs in a way similar to the annual license for each vehicle type. However, these would not be exactly equivalent since the prospect of spending such a sum on fuel is not the same as an immediate payment, even though the former may be larger.

CONCLUSION

The EEC member countries could shift all or part of their annual vehicle license taxation to taxes on fuel without regressive changes in the distribution of wealth. Such a measure holds the prospect of

achieving energy conservation and beneficial effects for the promotion of coordinated transport policies. However, the implementation of such a policy is complex, given motorist perceptions and the wide range of existing vehicle license systems and national car stocks.

In the United Kingdom and Ireland, the abolition of the flat-rate annual license and a return to a progressive system, be it related to engine size or a fuel tax, would certainly be beneficial, but for other countries the choice between a fuel tax and a graduated vehicle license is less clear and very much depends on a motorist's perception of costs and the way in which improved consumer information may supplement it.

The Dutch are currently considering the abolition of their annual vehicle license and its replacement by an increased fuel tax. If it proceeds, this should provide important evidence as to the role and potency of transport taxation in transport and energy policies. The value of consumer information innovations in conjunction with this taxation issue merits further investigation.

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Subsidies in Oregon Highway Transportation

MILAN KRUKAR, JOHN MERRISS, AND LOYD HENION

Subsidies have been identified in Oregon highway transportation since the first cost-responsibility study was done in 1937. The 1980 Oregon Motor Vehicle Cost-Responsibility Study identified similar equity problems. The lack of adequate highway funds makes it imperative that they be spent optimally and that all road users pay for their responsibility. In times of scarcity, favored groups can no longer be subsidized at the expense of others. The purpose of this paper is to examine the extent of subsidies inherent in Oregon's existing road user tax schedules. These subsidies are calculated on the basis of the tax schedules and recommendations developed from the 1980 Oregon Motor Vehicle Cost-Responsibility Study. The existing subsidies are compared with those found in the 1963 and 1974 Oregon cost-responsibility studies.

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OREGON COST-RESPONSIBILITY STUDIES

Background

The State of Oregon has long been a leader in applying cost responsibility to road user taxation. The 1980 study is in the tradition of previous Oregon studies that date back to 1937 (1-5). The use of the modern incremental approach in Oregon for allocating certain construction and maintenance costs started with the 1963 study (3) after the completion of the American Association of State Highway Officials (AASHO) Road Test.

Since 1905, three principles have guided the development of Oregon's road user tax system. These are that (a) those who use the public roads should pay for them, (b) road users should pay in proportion to the road user costs for which they are responsible, and (c) road user taxes should be used for constructing, improving, and maintaining the highways. Oregon has followed a pay-as-you-go philosophy in paying for its highways (6).